UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/937,623	12/28/2001	Noriyuki Matsumoto	109667	2068

7590 11/16/2004	EXAMINER
Oliff & Berridge	BHATNAGAR, ANAND P

ART UNIT	PAPER NUMBER
2623	

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DATE MAILED: 11/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	09/937,623	MATSUMOTO ET AL.
	Examiner	Art Unit	
	Anand Bhatnagar	2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.
2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-16_ is/are pending in the application.
    4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☒ Claim(s) _14 and 16_ is/are allowed.
6)☒ Claim(s) _1-12 and 15_ is/are rejected.
7)☒ Claim(s) _13_ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☒ The drawing(s) filed on _28 December 2001_ is/are: a)☒ accepted or b)☐ objected to by the Examiner.
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    a)☐ All   b)☐ Some * c)☐ None of:
      1.☐ Certified copies of the priority documents have been received.
      2.☐ Certified copies of the priority documents have been received in Application No. _____.
      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _12/28/01_.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 2, 4-9, and 15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 2 and 3: Examiner is unsure if there are multiple comparison points for each reference point or there are multiple comparison points for corresponding amount of reference points. The claim limitation calculates the density difference between each reference point and it's corresponding comparison point but the previous claim limitation states "respective comparison points are provided in correspondence to each reference point." Examiner will address this claim as best understood.

Regarding claims 4 and 15: Examiner is unsure if the waveform is a continuous waveform because the applicant is assuming the waveform is continuous. The wording of "assumed to" makes the claim indefinite. Examiner will address these claims as best understood.

Regarding claim 5: Examiner is unsure if the assumed waveform signal is a time series signal because the applicant is assuming that the

signal is a time series signal. This claim is indefinite due to the wording of

"assumed to."

Claim Rejections - 35 USC § 102

2.   The following is a quotation of the appropriate paragraphs of 35

U.S.C. 102 that form the basis for the rejections under this section made

in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4, 10, and 11 are rejected under 35 U.S.C. 102(b) as

being anticipated by Hara (U.S. patent 5,040,224).

Regarding claim 1: Hara discloses a method for evaluating a

fingerprint image, comprising the steps of:

obtaining a density of a reference point disposed within a fingerprint

image and a density of a comparison point disposed at a position shifted

from the reference point by a predetermined distance (fig. 7 and col. 5

lines 30-33, wherein the density of the picture elements, read as reference

and comparison points, on the lines are determined. The distances r sub I

and r sub n are read as the shifted distances); and

evaluating the amount of fingerprint ridgeline information contained

within the fingerprint image based upon a difference between the density

of the reference point and the density of the comparison point (col. 5 lines

38-51, wherein the differences between two adjacent picture elements are

determined which is used to determined the ridge curvature and direction,

read as the ridgeline information. The adjacent picture elements are read

as the reference point and the comparison point and it is irrelevant what

one is labeled, the reference or the comparison point, because two points

are being compared to each other).

Regarding claim 2: A method wherein a plurality of reference points

are provided within the fingerprint image and respective comparison points

are provided in correspondence to each reference point, and the

evaluating step comprises the steps of calculating the evaluation value for

each reference point based on a difference between the density of each

reference point and the density of the corresponding comparison point,

and evaluating the amount of fingerprint ridgeline information contained

within the fingerprint image based upon the calculated evaluation value of

each reference point (col. 5 lines 38-51, wherein the differences between

picture elements, from the first element to the n-th element, are calculated

along the line A sub dc and the differences calculated and the ridge line

curvature and direction (read as information) is determined. These picture

elements are both the reference points as well as the comparison points

wherein the label, of reference or comparison point, would switch when

the difference between adjacent picture elements is calculated. For

example the difference between the 1st and 2nd picture elements is

determined and the 1st element can be labeled as the reference point and

the 2nd one as the comparison point. Then moving down the line to

calculate the difference between the 2nd picture element and the 3rd

picture element the 2nd picture element can be now labeled as a reference

point and the 3rd element as the comparison point, and so on down the

line all the way to the n-th element. This results in multiple comparison

points and reference points. The ridge direction and the curvature of the

points are read as the "evaluation values" of the picture elements.).

Regarding claim 3: See claim 2.

Regarding claim 4: A method for evaluating a fingerprint image,

comprising the steps of:

obtaining a density at each point on a reference line provided within

a fingerprint image (fig. 7 and col. 5 lines 20-37);

determining a characteristic of an oscillation signal, in which the

density of each point obtained in the density obtaining step is assumed to

form a continuous waveform signal along the direction of the reference

line (figs. 7 and 8 and col. 5 lines 52-64, wherein the curves of the density

points is determined. These curves are oscillation signals and it is a

continuous waveform); and

evaluating the amount of fingerprint ridgeline information contained

within the fingerprint image based on the result obtained in the

characteristic determining step (col. 5 lines 52-64 wherein the graph curve

shows the ridge information).

Regarding claim 10: Hara discloses a method for evaluating a

fingerprint image, comprising the steps of:

obtaining a density pattern of an established area provided within a fingerprint image (fig. 7 and col. 5 lines 26-35, wherein the picture elements on a line A sub dc are determined. Each picture element is read as a established area);

obtaining a density pattern of a comparison area provided by shifting the established area in predetermined direction and by predetermined distance (Hara; col. 5 lines 25-32 wherein the points are shifted along the line, read as predetermined direction, at a distance of r sub l or r sub n, read as a predetermined distance);

calculating a similarity between the two density patterns obtained in said processing steps (col. 5 lines 32-37, wherein the variation between the points is determined. This variation is read as the similarity between the densities); and

evaluating the amount of noise contained within the fingerprint image based upon the amount of the similarity calculated in said calculation step (col. 5 lines 32-37, wherein the variation "similarity" determines the amount of dust or contamination, read as noise. No variation means no dust/contamination and vice versa.).

Regarding claim 11: A method wherein the established area is a straight line provided within the fingerprint image, the comparison area is a straight line provided to correspond with the provided straight line, and the similarity of the density pattern of each area is evaluated by the similarity of a waveform signal, wherein the density of the points on the straight line

composing each area is regard as a continuous waveform signal in the direction of the straight line (figs. 7 and 8, wherein the line A sub dc. is composed of small straight segments/lines). For the waveform see claim 4.

Claim Rejections - 35 USC § 103

3.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 5, 7-9, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hara (U.S. patent 5,040,224) and Hamada et al. (U.S. patent 5,426,708).

Regarding claim 5: A method wherein the characteristic of the oscillation signal is a spectrum characteristic of a spectrum obtained by frequency converting the waveform signal, in which the waveform signal is assumed to be a time series signal.

Hara discloses a fingerprint evaluation system wherein the density points of reference lines are used to determine the ridge line information. Hara further discloses to obtain the curve of density points of the fingerprint image (Hara; figs. 8 and 9). Hara does not teach to get the frequency of the curve/waveform in order to determine the ridge line

information. Hamada et al. teaches to determine the frequency spectrum

of a fingerprint image in order to determine the ridge lines in the image

(col. 1 lines 60-65 and col. 5 lines 47-55, the frequency spectrum is read

as a time series signal). It would have been obvious to one skilled in the

art to combine the teaching of Hamada et al. to that of Hara because they

are analogous in fingerprint analysis. One in the art would have been

motivated to incorporate the teaching of Hamada et al. to that of Hara in

order to reduce the data size compared to the data size of the fingerprint

image (Hamada et al.; col. 2 lines 3-6).

Regarding claim 7: A method wherein the evaluating step

comprises the step of evaluating the amount of fingerprint ridgeline

information contained within the fingerprint image based upon the size of a

spectrum peak of the obtained spectrum (Hamada et al.; col. 1 lines 60-

65, wherein the peak of the spectrum is used to determine the ridges).

Regarding claim 8. Hara discloses wherein a plurality of reference

lines are provided within the fingerprint image (Hara; fig. 7 and col. 5 lines

52-62, wherein two reference lines, line A sub dc and line A sub d′c′)

determined. Hara does not teach to get the frequency of the

curve/waveform in order to determine the ridge line information of the

fingerprint image. Hamada et al. teaches to determine the frequency

spectrum of a fingerprint image in order to determine the ridge lines in the

image (col. 1 lines 60-65 and col. 5 lines 47-55). It would have been

obvious to one skilled in the art to combine the teaching of Hamada et al.

to that of Hara because they are analogous in fingerprint analysis. One in the art would have been motivated to incorporate the teaching of Hamada et al., modified to obtain frequency characteristics of both reference lines, to that of Hara in order to reduce the data size compared to the data size of the fingerprint image (Hamada et al.; col. 2 lines 3-6).

Regarding claim 9: A method wherein said reference lines are provided orthogonally in two directions within the fingerprint image (Hara; fig. 7, wherein the two lines, line A sub dc and line A sub d'c', are orthogonal to each other).

Regarding claim 12: A method wherein the similarity calculating step comprises the step of obtaining spectral characteristics by frequency converting the waveform signal, while regarding it to be a time series signal, and calculating the similarity between the spectrum characteristics of the two corresponding waveform signals. See claim 5.

Allowable Subject Matter

4.   Claims 14 and 16 are allowed.

Claim 13 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
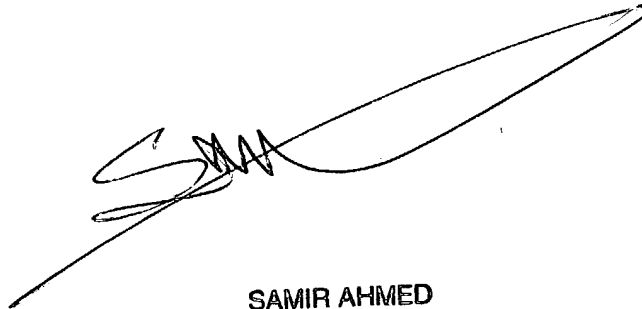
Conclusion

5.   The prior art made of record and not relied upon is considered

pertinent to applicant's disclosure.

          Riganati et al. (U.S. patent 4,156,230) for determining the

peaks and valleys of a fingerprint image.

Contact Information

6.   Any inquiry concerning this communication or earlier

communications from the examiner should be directed to Anand

Bhatnagar whose telephone number is (703) 306-5914, whose supervisor

is Amelia Au whose number is 703-308-6604, group fax is 703-872-9306,

and Tech center 2600 customer service office number is 703-306-0377.

SAMIR AHMED
PRIMARY EXAMINER

Anand Bhatnagar

Art Unit 2623

November 14, 2004